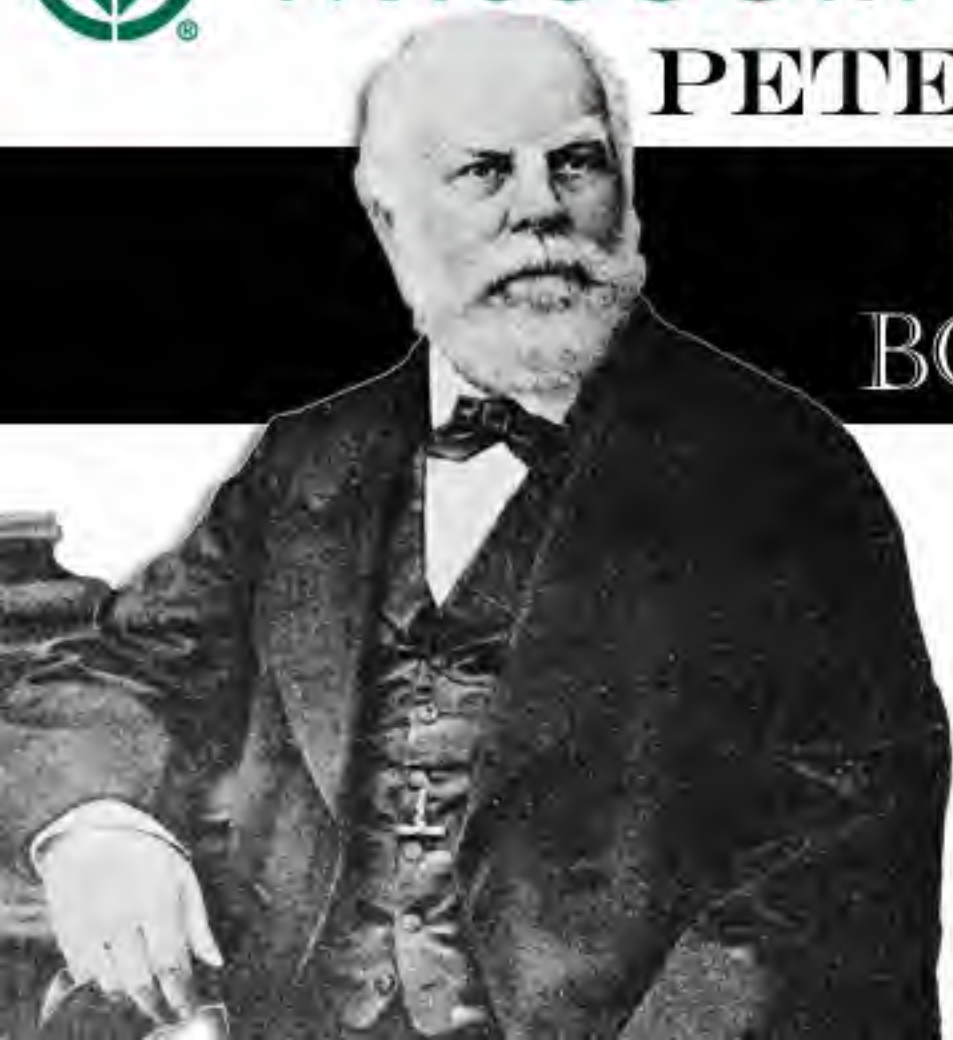


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BOTANICAL NOTEBOOKS



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7 Feb

65

P. australis

336-342



0 1 2 3 4 5 6 7 8 9 10

cm

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MISSOURI
BOTANICAL
GARDEN

11307

MISSOURI BOTANICAL GARDEN
GEORGE ENGELMANN PAPERS



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cm

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Pinus palustris s. *australis*
Herb. Durand

March 4 1865

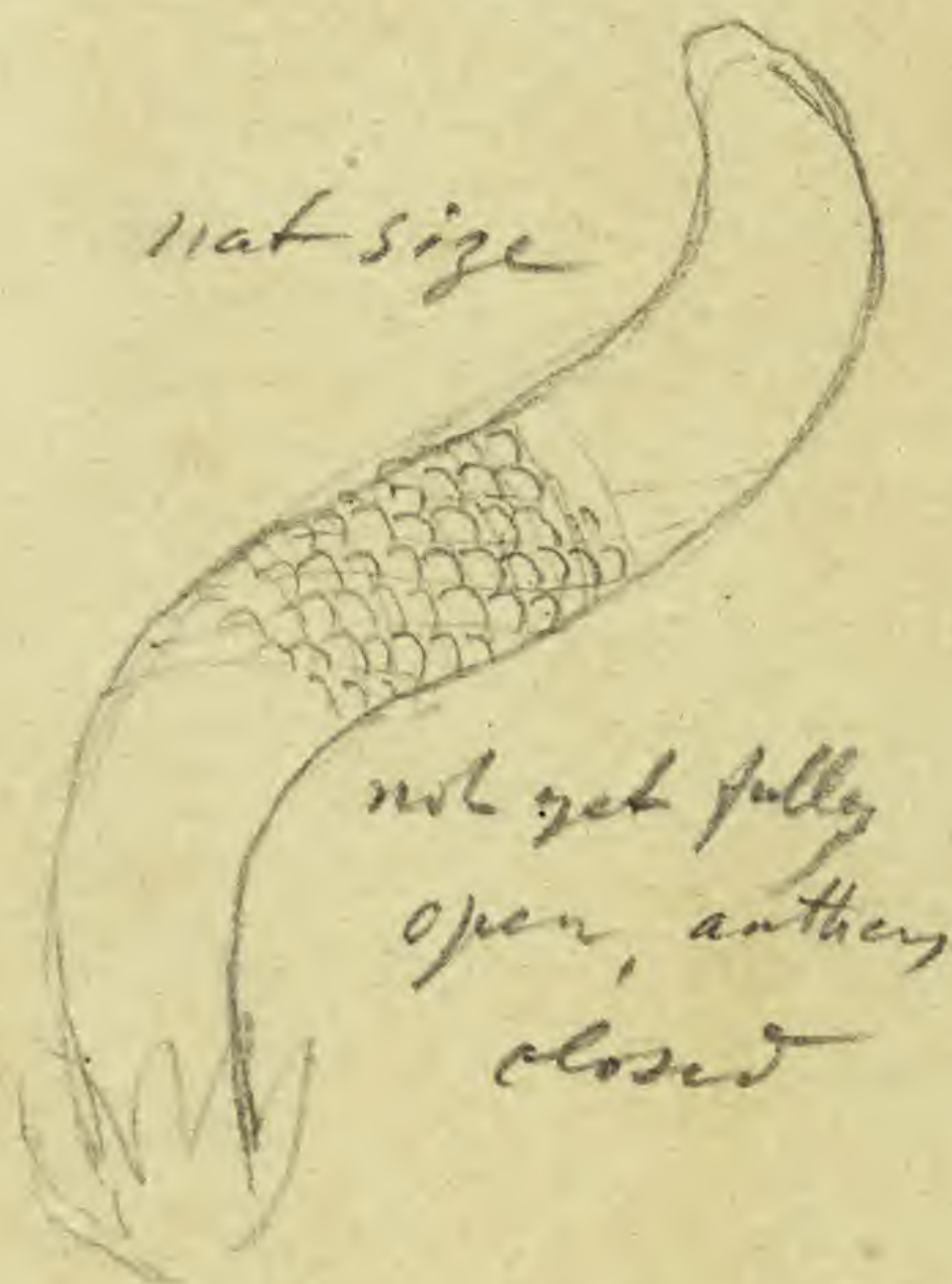
nat size



internal

external

nat size



not yet fully
open, anthers
closed

x4



8 Cotyled -
longer than the stemlet



Pollen, longest diamet

x415

(grains mouldy, boiled)

0.033 - 0.040 Lin



anther x10



0 1 2 3 4 5 6 7 8 9 10

cm

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MISSOURI
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GARDEN

11308

LEITCH & CORLIES,
DRUGGISTS,

South-West Corner of Fifth and Market Streets.

MISSOURI BOTANICAL GARDEN
GEORGE ENGELMANN PAPERS



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cm

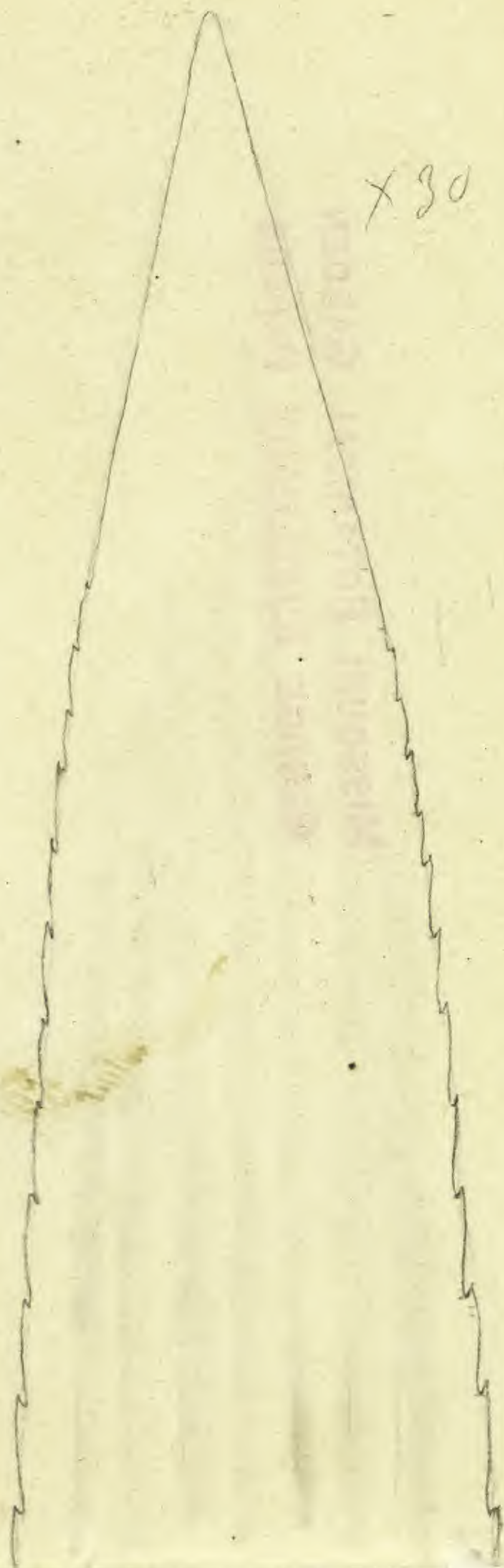
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Pinus australis
Curtis inset

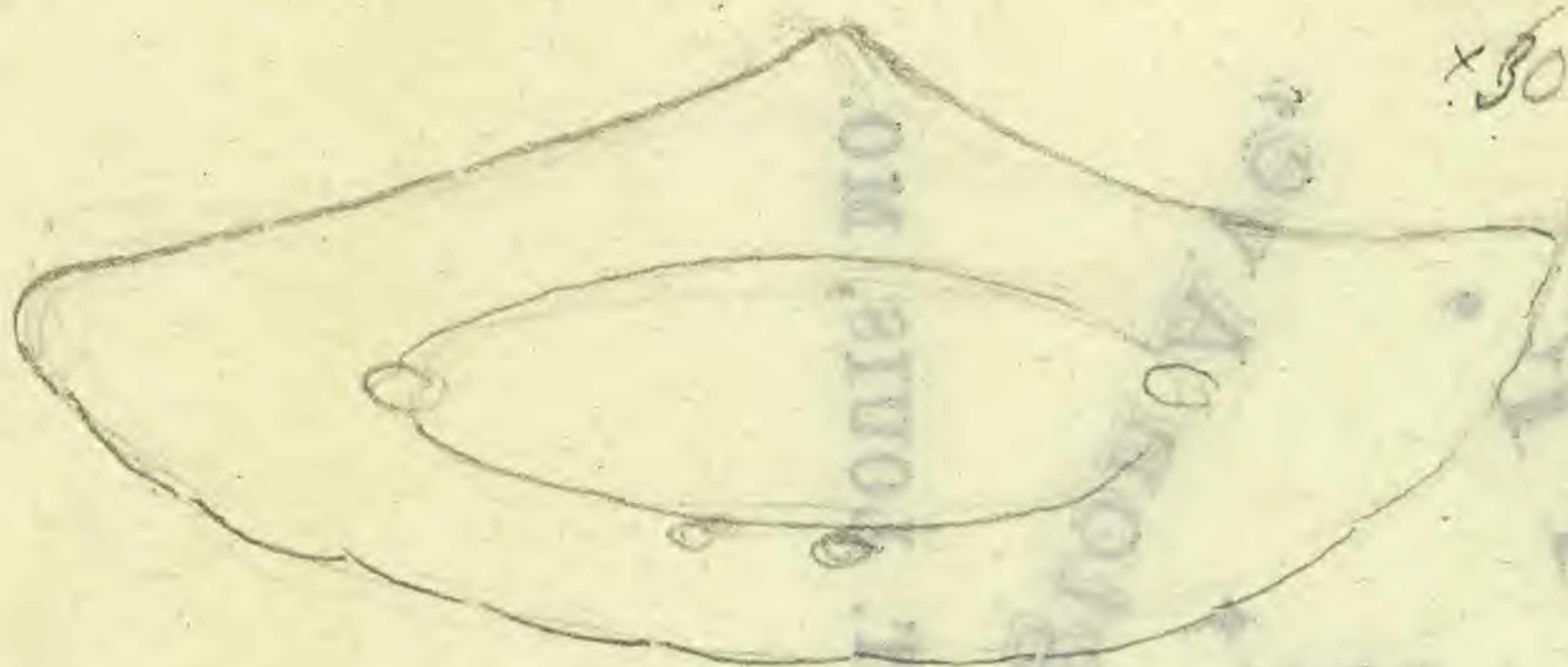
March 15 1871



x30



x60



x30



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cm

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MISSOURI
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GARDEN

11309

L. O. WOODRUFF,
Druggist,
Cor. Sixth St. & Washington Ave.,

Opposite Lindell Hotel,
ST. LOUIS, MO.

MISSOURI BOTANICAL GARDEN
GEORGE ENGELMANN PAPERS



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cm

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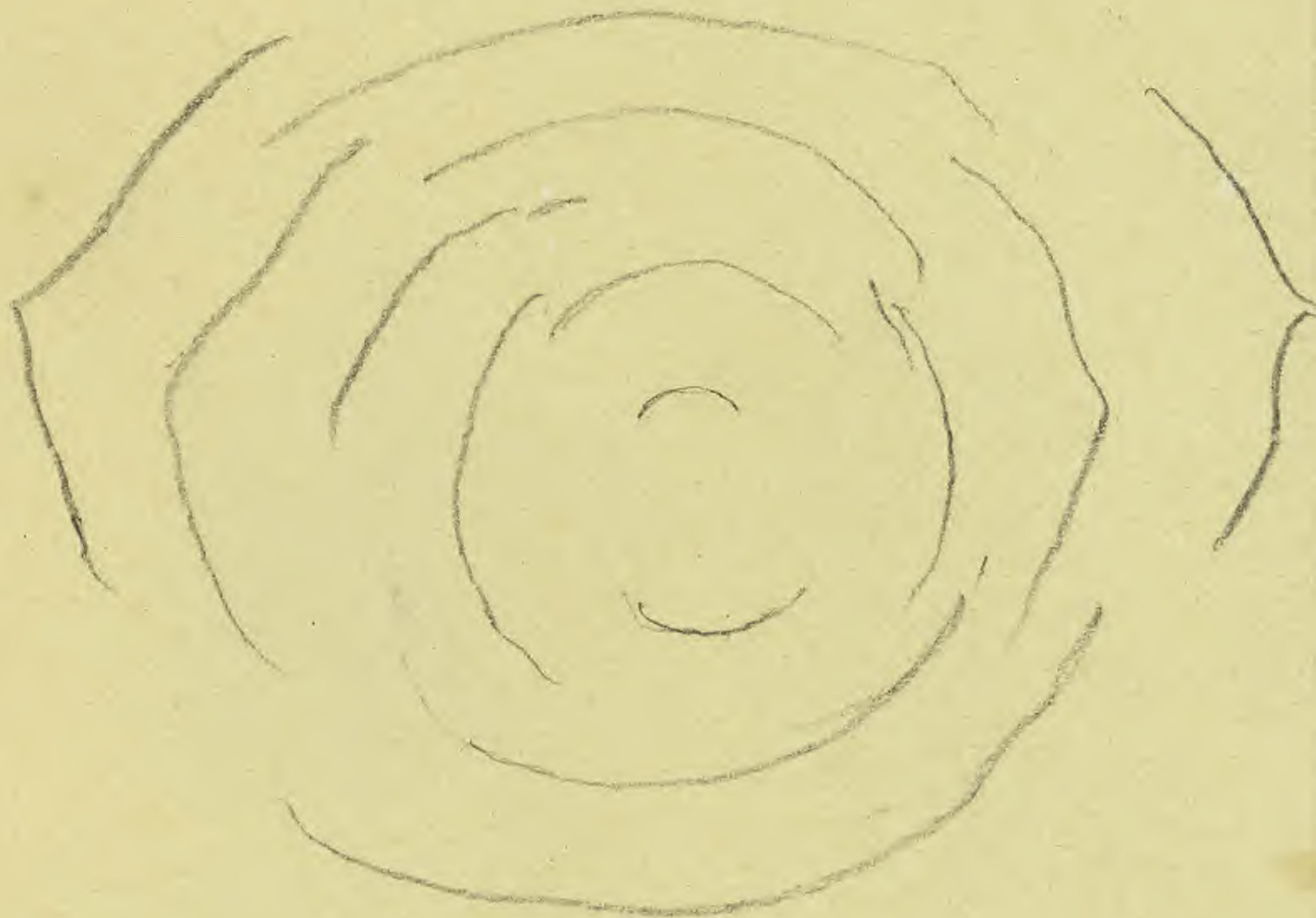
MISSOURI
BOTANICAL
GARDEN

Pinus australis

Dec 30 1879

S. Carolina H. Mellichamp

x4



Dorsal view
towards the base



0 1 2 3 4 5 6 7 8 9 10

cm

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MISSOURI
BOTANICAL
GARDEN

11310

HENRY T. ROHLFINS,
APOTHECARY.

No. 2600 Laclede Ave., S. W. Cor. Jefferson Ave.

ST. LOUIS, MO.

R

MISSOURI BOTANICAL GARDEN
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cm

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GARDEN

P. australis

March 8' 1880

John Pollen

March 14 1880, S.C.

x 415



$$\frac{29 - 24, \text{ mostly } 31 - 22 \text{ mm}}{415} = 0.070 - 0.082, \\ \text{mostly } 0.075 - 0.080$$

$$\frac{12^6 - 16^3, \text{ mostly } 14^6 - 15^6 \text{ lines}}{415} = 0.030 - 0.039 \\ \text{mostly } 0.035 - 0.037$$



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MISSOURI BOTANICAL GARDEN
GEORGE ENGELMANN PAPERS

Cor. 4th & Olive Sts., St. Louis.

APOTHECARY & CHEMIST,

Alex. Leitch,

11311



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cm

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MISSOURI
BOTANICAL
GARDEN

6 Feb

64

P. Banksiana

330-5



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cm

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GARDEN

11312

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cm

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GARDEN

x415

Pinus Banksiana
 Michx. Loph. nris
 Pollen, 0.026-0.028 l. m., very rarely

June 1863

0.030

0.027



0.028



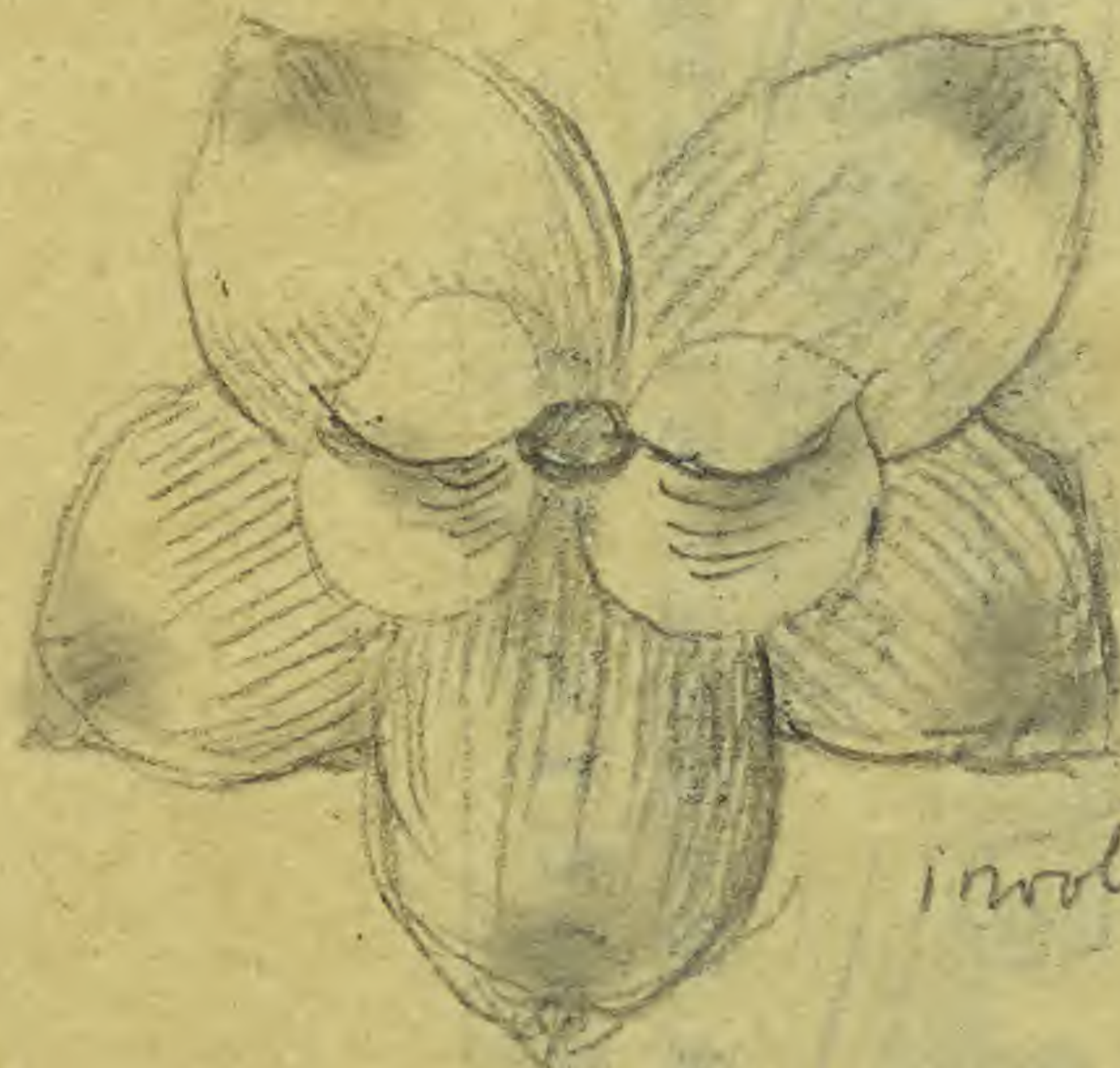
0.026



0.030



x4



involucrum



7 involucrum
 Bracts



x10



front

top



lateral



0 1 2 3 4 5 6 7 8 9 10

cm

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MISSOURI
 BOTANICAL
 GARDEN

11313

JONES & LEITCH, DRUGGISTS

COR. FIFTH & MARKET STREETS,

ST. LOUIS, MO.

J. M. Kittick & Co. Cor. Main & Vine.

MISSOURI BOTANICAL GARDEN
GEORGE ENGELMANN PAPERS



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cm

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Pinus Banksiana

Ontonagon July 1863

x2

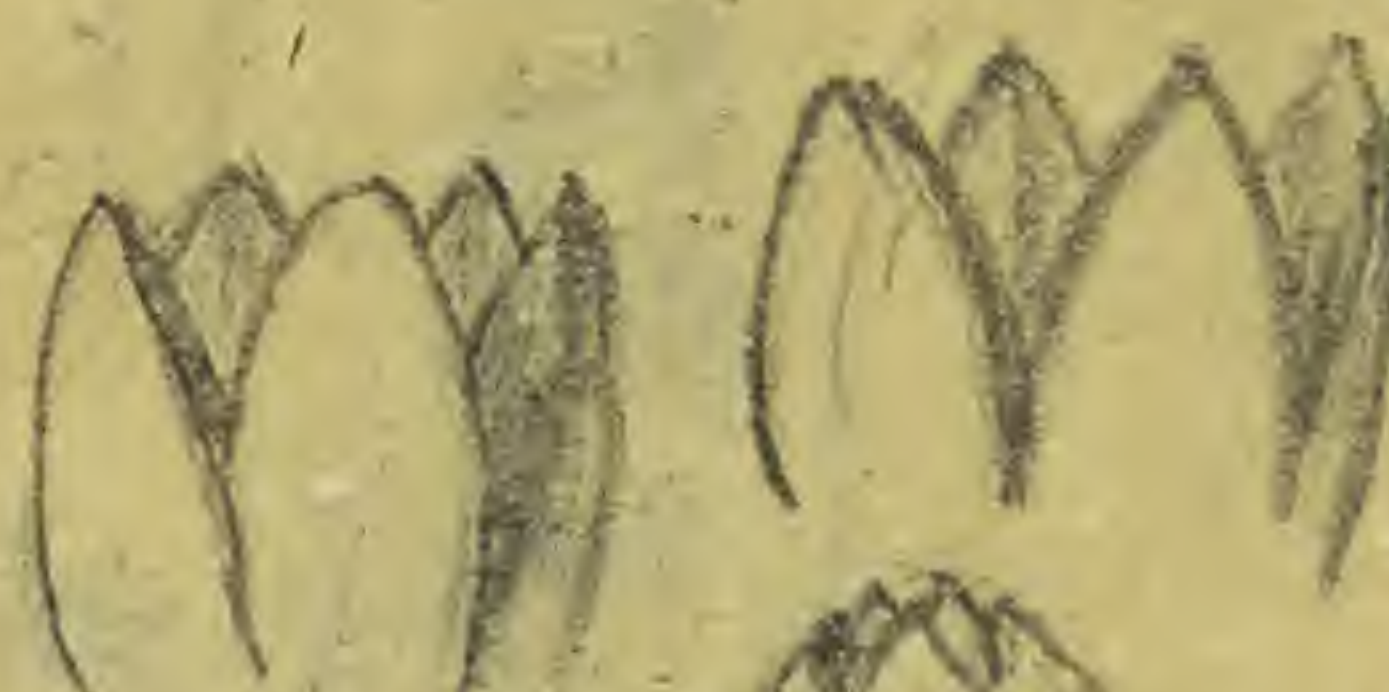


seed black
2-3 ribbed
on inside
smooth outside

empty
wing

seed & wing exactly
like that of *Picea*

x10



albin
different forms

5 (rarely 4) cotyled.

inner coats of seed
boiled

x415: outer darker,
a little folded,
inner one
finer, granular
even



middle coat
folded, not cells

innermost
coat, granular



seed
lower larger
stems scale

seed, stems, outer
fertile middle scale



0 1 2 3 4 5 6 7 8 9 10

cm

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GARDEN

11314

JONES & LETCH, DRUGGISTS

COR. FIFTH & MARKET STREETS,

ST. LOUIS, MO.

J. McKittrick & Co. Cor. Main & Vine.

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GEORGE ENGELMANN PAPERS



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cm

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x 415

Pinus Banksiana

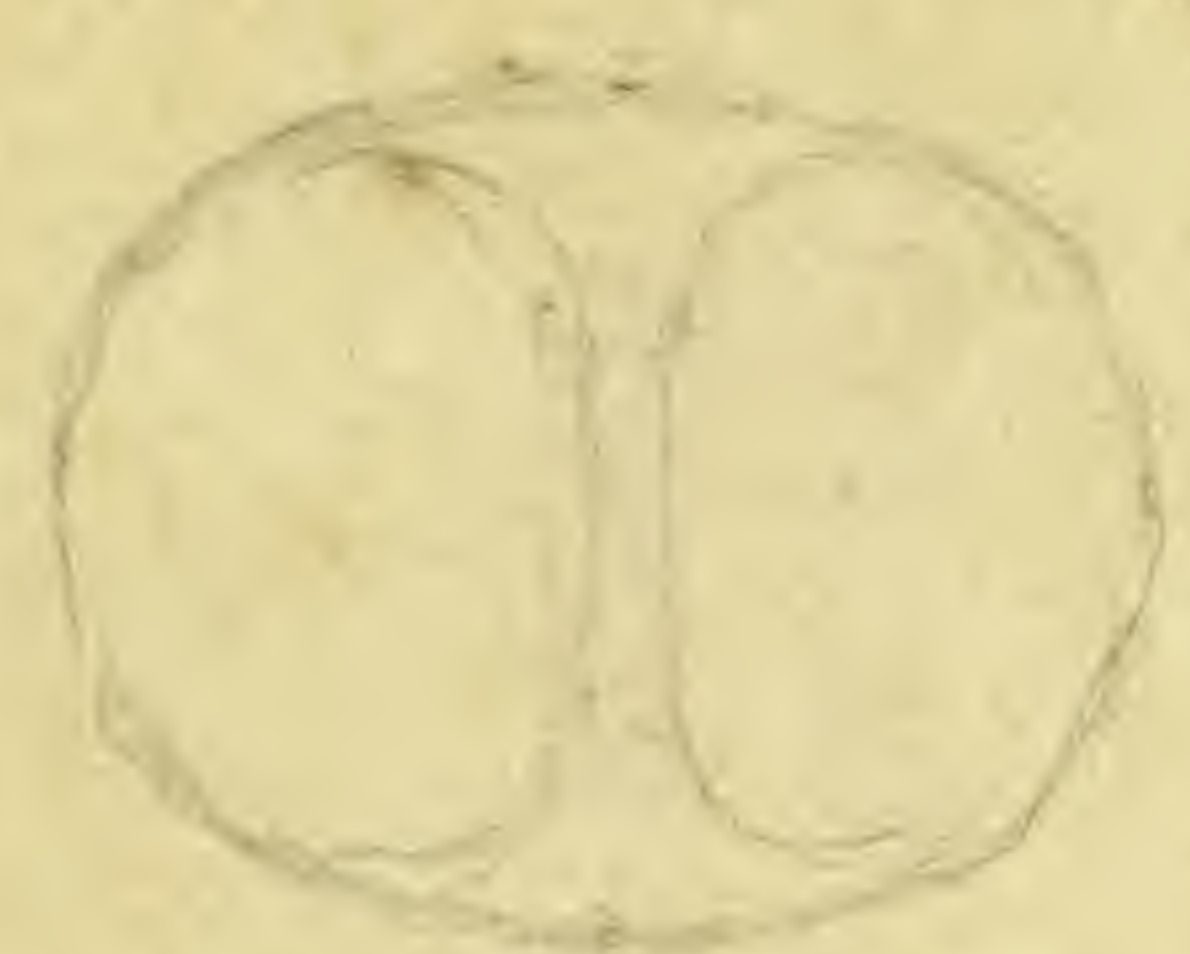
July 1863

Oconto, Wis., E. P. Austin mis. vivian

July 1863

Pollen 0.023-0.027

0.023



0.027

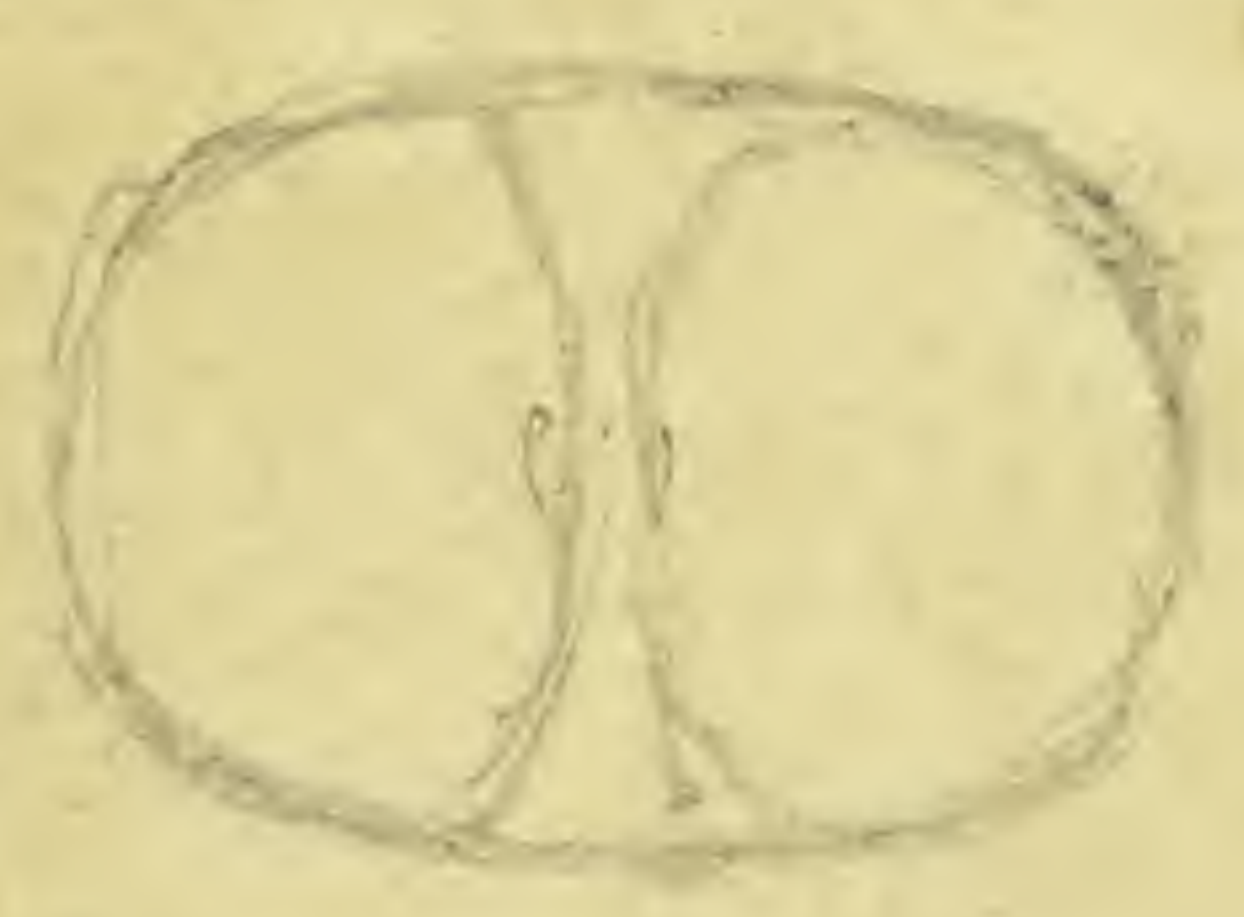
0.024



0.025



0.023



0.026



x4

x4



young fruit

x4

0.026 - 0.028

36 better Pollen, average 0.027



ext. lateral
side of scaly
at last life

x10



middle



from lower
part of cone

7-8, middle
leaves



x2



sect.

July 25-26
1863



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GARDEN

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JONES & LETCH

Druggists

Cor. Fifth & Market Sts. ST. LOUIS, MO.

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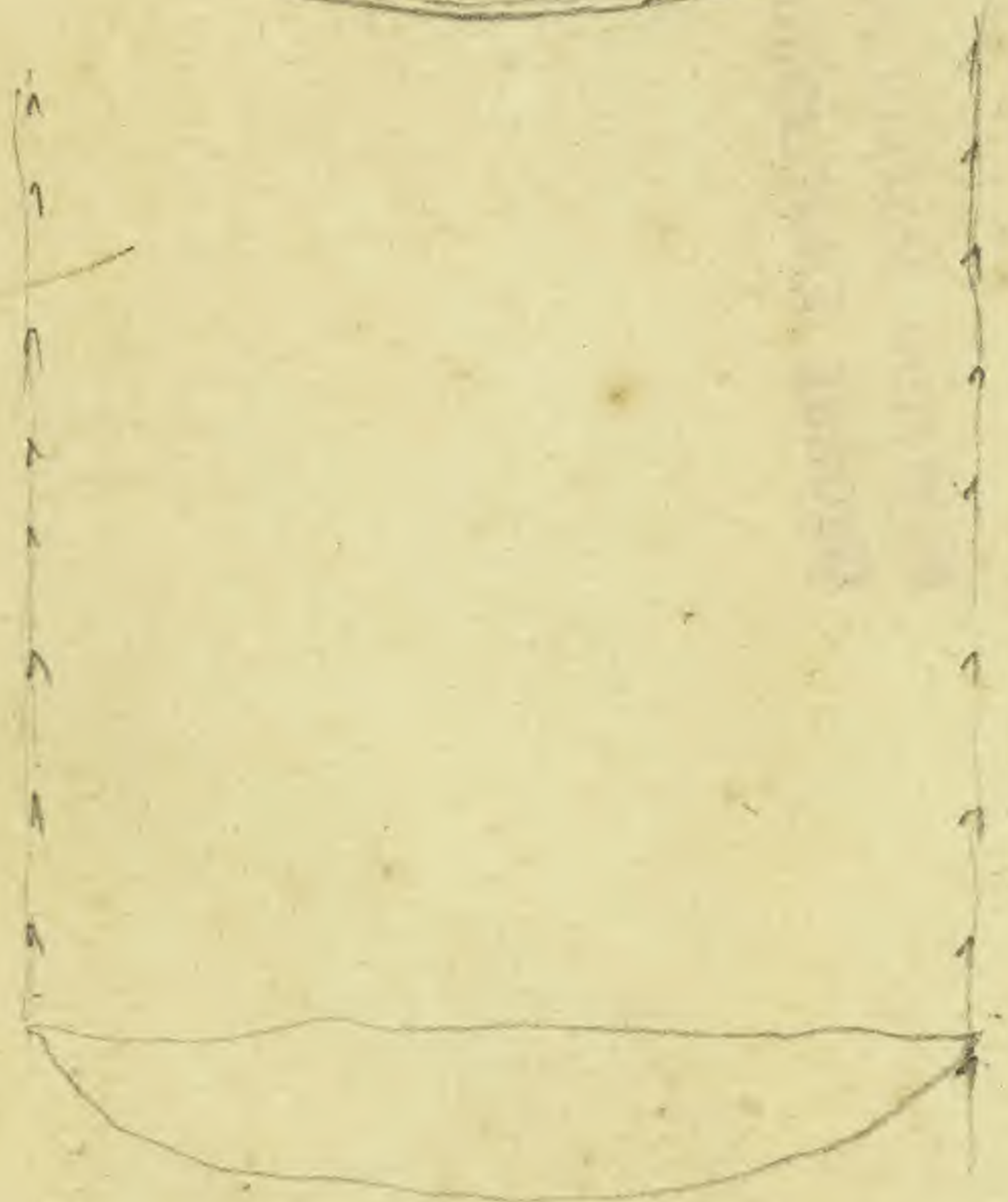
Pinus Banksiana

Wilson
ad v.

July 26, 1863



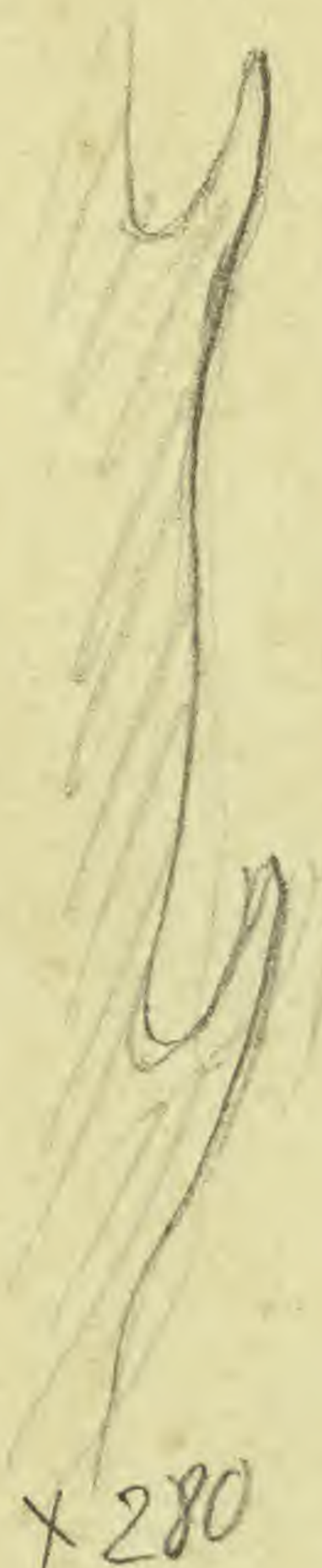
X30



X30



X60



X280

Sheath of
young leaves 3 l. b.
in old ones 1-1 1/2 l.
at last almost
disappearing.

Teeth not exactly on edge, but
somewhat on upper surface.



0
cm

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JONES & LETCHER

Druggists

Cor. Fifth & Market Sts. ST. LOUIS, MO.

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Pinus Banksiana

May 9 1877

H.B. Morrison

May 8 1877

first Pine in bloom

Pollen $\frac{23.5 - 25}{415} = 0.057 - 0.060$ mm

mostly $\frac{24}{415} = 0.058$ mm

anthers in 8 rows

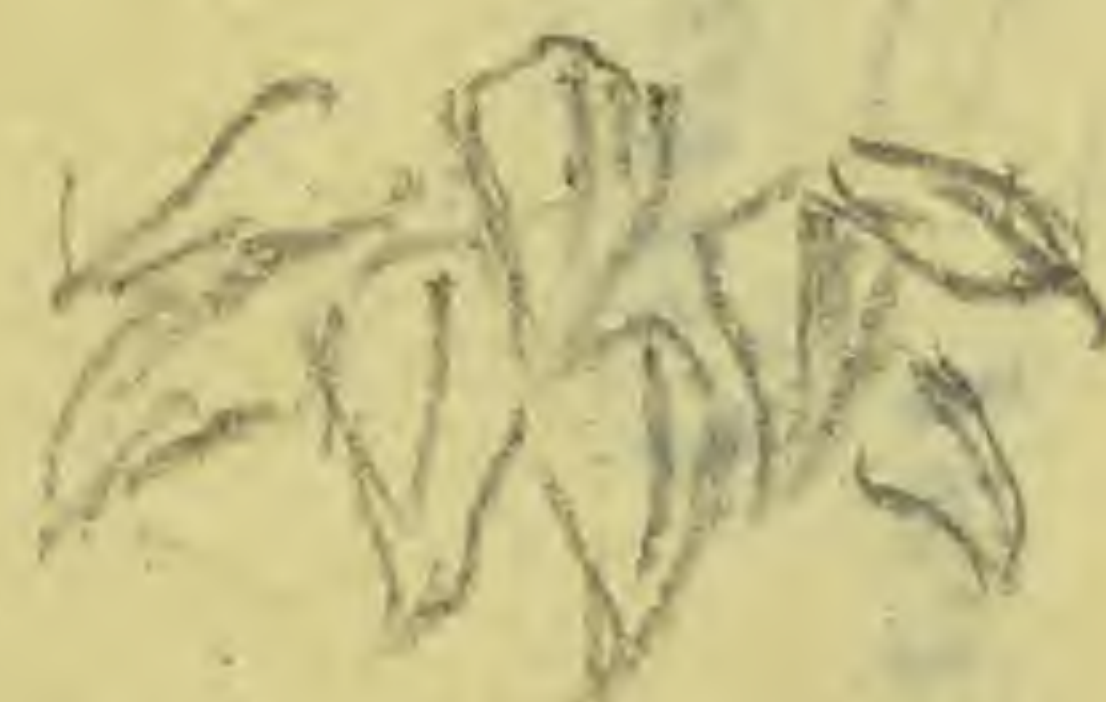
$\times \frac{1}{2}$

fresh



Carinate lateral
scales almost
equal to inner ones

part of fem. ament
 $\times \frac{1}{4}$



tips short, carinate
above, spreading



lateral



5-6

6 scales of nearly
equal length



$\times 10$



0 1 2 3 4 5 6 7 8 9 10

cm

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11317

Leitch & Corlies

DRUGGISTS

South West
Corner Fifth
and Market
Streets.

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GEORGE ENGELMANN PAPERS

2.50
2.40
2.45
2.50

1.00
2.40
2.50
60

2.50
2.40
2.45
2.50
4.50



0

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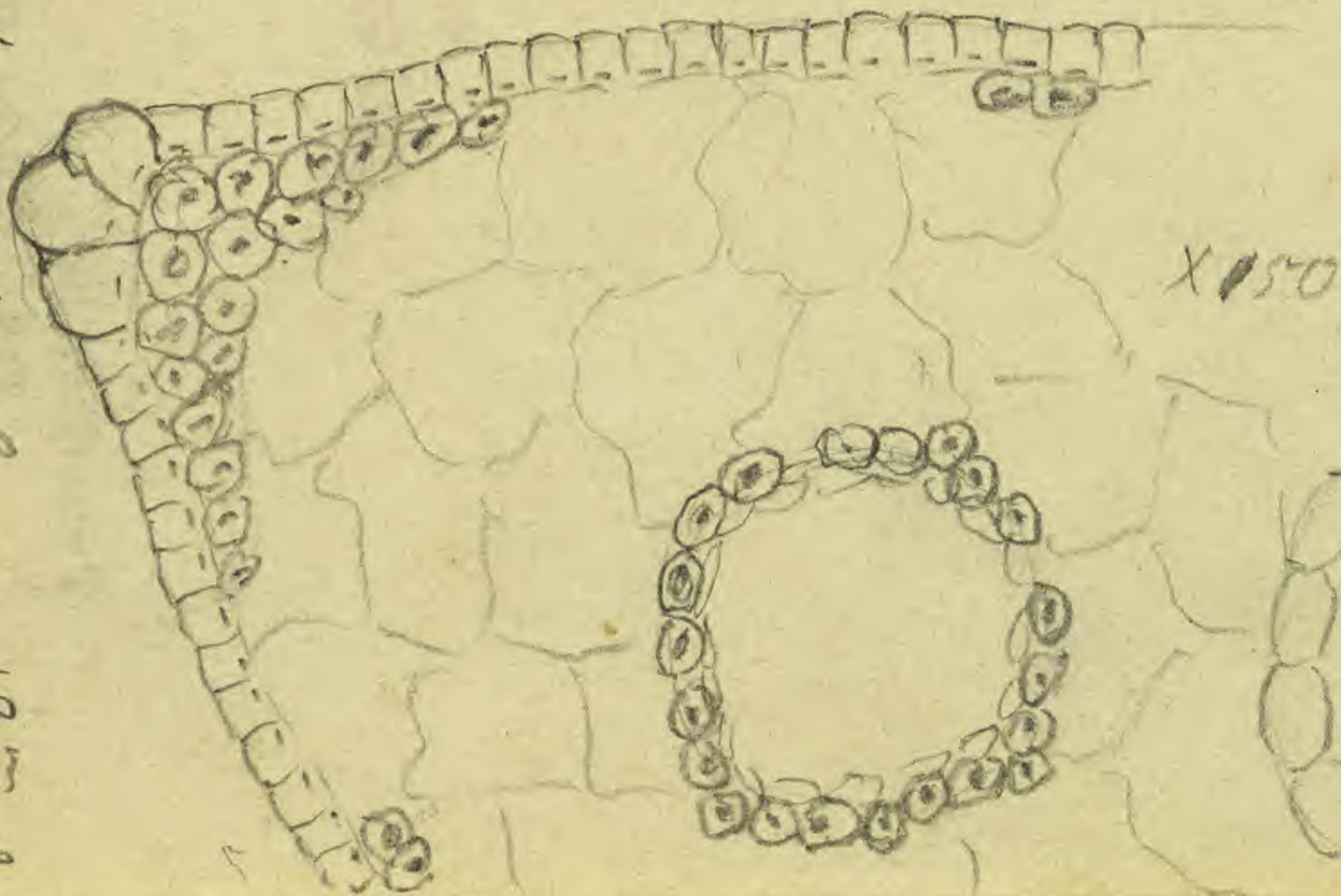
May 19 1878

Pia Banksiana

Lake Superior, Gillman

cup 2 mm wide

x 30



x 50



duct of Austin
specimen
see below
x 60

x 30

two large lateral parenchymatous
ducts surrounded by hypoderm cells
hypoderm on angles and sparingly
and interrupted on lower side
very little on upper side
bundle of vessels far separate

F Austin, northern *W. Banksiana* is the same
but hypoderm on duct weak and scarcely
developed.

Boerhaave, *Saxifraga* has similar leaves, 1/3" wide
more hypoderm pointing on upper side; very feeble
by position and just - structure more slender



0 1 2 3 4 5 6 7 8 9 10

cm

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11318

GEO. B. FRESE & CO'S,
No. 3005 Olive Street,
Near Garrison Av. ST. LOUIS.

Prescription Store,

MISSOURI BOTANICAL GARDEN
GEORGE ENGELMANN PAPERS

Prescribed by

DR. GEO. ENGELMANN,

N. W. Cor. Garrison Ave. & Locust St.,



0
cm

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